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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,300	01/21/2004	Meng-Seng Chen		3229

7590 05/21/2007  
Chiou, Ta-gang  
14th Floor  
One Broadway  
Cambridge, MA 02142

EXAMINER
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PORTIS, SHANTELL L

ART UNIT	PAPER NUMBER
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2617

MAIL DATE	DELIVERY MODE
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05/21/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/760,300	<b>Applicant(s)</b> CHEN ET AL.	
	<b>Examiner</b> Shantell Portis	<b>Art Unit</b> 2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 February 2007.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 1/21/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments filed on February 9, 2007 have been fully considered but they are not persuasive.

The applicant argues that Lee et al. does not disclose or suggest a method for determining registration areas according to dynamic partition units as described in amended claim 1. The examiner respectfully disagrees.

Lee et al. discloses a plurality of location areas that are determined so that the paging load is distributed among the plurality of location areas such that a partial paging load respective to each cell of the multicell wireless communication system is less than a respective load limit. Boundaries of the location areas are chosen to substantially minimize registration load within the multicell wireless communication system such that the overall cost of the wireless communication system can be minimized. A graph partitioning algorithm, such as a modified KL algorithm may be used to create the location areas and set the boundaries. See Abstract.

Lee et al. further discloses the method where the total number of VMLA registrations are minimized while ensuring that the load on every VMLA in the service area is less than the limit. A KL graph algorithm is used to find the optimal boundary setting of the VMLAs by adjusting boundaries of the VMLAs until the optimal boundary setting is determined. Loading characteristics (mobility data) based on historical information and simulations are also used in determining the optimal boundary. See Col. 5, lines 61-66; Col. 7, lines 13-25 and Col. 11, lines 14-63. Lee et al. discloses

determining the "best" cell, moving border cell from one of two VMLAs to the other VMLA. A determination is made as to the "best" cell and "best pair" of cells that would have the greatest positive impact and for determining balanced VMLAs. All possible beneficial combinations are considered with the optimal combination. Once the optimal combination is determined, the loads for the VMLAs are determined so that the loading constraint limit is satisfied. See Col.12, line 6-Col. 13, line 39.

Therefore, Lee et al. discloses a method for determining registration areas (VMLAs) based on mobility data (loading characteristics and KL graph partitioning algorithm) where the overall cost is minimized (lesser paging load and reducing registration loading). These registration areas are determined by finding the "best" cell and "best pair" cells for swapping that will have the greatest positive impact i.e. the loading constraint limit is satisfied.

The examiner maintains the rejections as set forth below.

***Claim Rejections - 35 USC § 102***

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. (Lee), U.S. Patent No. 6,138,025.

**Regarding Claim 1**, Lee discloses a method for determining a plurality of registration areas in a wireless communication system, comprising the steps of: determining a plurality of mobility data (**loading characteristics**) corresponding to a plurality of first partition units respectively and an overall cost (**paging load and registration load**) of a plurality of first registration areas, wherein each of the first registration areas includes at least one of the first partition units; generating a plurality of second registration areas through a registration area determining procedure, wherein the second registration areas are constructed based on the mobility data of the first partition units; determining an overall cost of the second registration areas; comparing the overall cost of the first registration areas and the second registration areas; determining a plurality of third registration areas and second partition units based on the result of comparison, wherein at least one of the second partition units is generated by combining at least two of the first partition units based on the mobility data of the corresponding first partition units when the overall cost of the first registration areas is lower than or equal to the overall cost of the second registration areas, at least one of the second partition units is generated by partitioning one of the first partition units based on the mobility data of the corresponding first partition units when the overall cost of the first registration areas is higher than the overall cost of the second registration areas; and repeating the above steps to generate a plurality of fourth registration areas and then to determine a plurality of fifth registration areas and third partition units. (**Col. 5, line 16-Col. 6, line 7**).

**Regarding Claim 2**, Lee discloses wherein the method is executed recursively until a plurality of  $(2n)$ th registration areas and  $n$ th partition units are determined that each of the  $(2n)$ th registration areas includes only one  $n$ th partition unit and the overall cost of the  $(2n-1)$ th registration areas is smaller than or an equal to the overall cost of the  $(2n)$ th registration areas (**Col. 11, lines 37-63**).

**Regarding Claim 3**, Lee discloses wherein the mobility data at least include a plurality of mobility rates (**Col. 7, lines 13-25**).

**Regarding Claim 4**, Lee discloses wherein the mobility rates are determined by a plurality of traffic sources in the wireless communication system through at least one of the following operations which are gathering historical data, simulation and estimation (**Col. 7, lines 13-25**).

**Regarding Claim 5**, Lee discloses wherein the second partition units are determined based on a plurality of loading limits of the wireless communication system (**Col. 6, line 64-Col. 7, line 12**).

**Regarding Claim 6**, Lee discloses wherein the loading limits at least include a plurality of constraints corresponding to any physical or virtual equipment in the wireless communication system (**Col. 4, lines 51-62**).

**Regarding Claim 7**, Lee discloses wherein the registration area determining procedure is at least one of the K-L algorithm and the F-M algorithm (**Col. 11, lines 14-36**).

**Regarding Claim 8**, Lee discloses wherein the registration area is determined by at least one of the following: a location area (LA) of a GSM system, a routing area (RA)

of a packet-switched or a 3G systems, a registration location area (RLA)/overlapping location area (OLA) and a paging area of a PDC and a PHS system, a cell area (CA) of a 3G systems, and an UTRAN Registration Area of a UMTSWCDMA system (**Col. 4, line 51-Col. 5, line 4**).

**Regarding Claim 9**, Lee discloses wherein when the first partition units are non-partitionable, generating the second partition units by combining at least two of the first partition units based on the mobility data of the corresponding first partition units is done (**Col. 12, line 6-Col. 13, line 23**).

#### ***Conclusion***

4. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 2617

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shantell Portis whose telephone number is 571-272-0886. The examiner can normally be reached on Monday-Friday 7:00am-3:30pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on 571-272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

  
SLP

  
LESTER G. KINCAID  
SUPERVISORY PRIMARY EXAMINER